Claims

We Claim:

1. A method for increasing a rate at which a chromium volume is etched, said method comprising:

providing said chromium volume that includes chromium, said chromium volume continuously contacted by an acid solution;

said chromium volume in continuous electrical contact with a metallic body, wherein the metallic body is continuously contacted by said acid solution; and

etching the chromium volume.

2. The method according to claim 1, wherein said chromium volume includes an oxide of chromium and metallic chromium.

3. The method according to claim 1, wherein said metallic body includes steel.

4. The method according to claim 1, wherein said acid solution comprises hydrochloric acid.

5. The method according to claim 4, wherein said hydrochloric acid solution has a molar concentration between about 0.3 and about 6.

6. The method of claim 4, wherein said hydrochloric acid solution is maintained at a temperature between about 35°C and about 70°C.

7. The method of claim 1, wherein the acid solution is applied to the chromium layer as a spray.

8. The method of claim 1, wherein the acid solution is applied to the chromium layer in a dip bath.

9. The method of claim 8, wherein the acid solution is a mixture of sodium chloride (NaCl) and hydrochloric acid (HCl).

10. The method of claim 1, wherein the metallic body includes steel, wherein the chromium volume includes metallic chromium, wherein the acid solution includes hydrochloric acid, wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M), and wherein the etch rate

is at least a factor of about 2 greater than an etch rate that would occur in an absence of the iron-comprising body.

11. The method of claim 1, wherein the iron-comprising body includes steel, wherein the chromium volume includes metallic chromium, wherein the acid solution includes hydrochloric acid, wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M), and wherein the etch rate is at least about 5 Å/second.

12. The method of claim 1, further comprising forming hydrogen bubbles at a surface of the metallic body, said surface in contact with the acid solution.

13. The method of claim 1, wherein:

the metallic body includes steel;

the chromium volume includes an oxide of chromium and metallic chromium;

the acid solution comprises hydrochloric acid; and

the chromium volume is disposed upon a substrate, said substrate including a conductive metal, wherein selected areas of said conductive metal are exposed by the etching of the chromium

volume.

14. The method of claim 1, wherein the acid solution is includes an acid of a form HX, wherein X is selected from the group consisting of fluorine, chlorine, bromine, and iodine.

15. The method of claim 1, wherein the etching of the chromium volume is stopped when a portion of the chromium volume remains.

16. The method of claim 1, wherein the etching of the chromium volume continues until the entire chromium volume is removed.

17. The method of claim 1, further comprising bonding the chromium volume to a fluoropolymer dielectric volume.

18. An electrical structure, comprising:

a chromium volume;

an iron-comprising body in continuous electrical contact with the chromium volume; and

an acid solution in continuous contact with both the chromium volume and the iron-comprising body, wherein the chromium body is being etched at an etch rate.

19. The electrical structure of claim 18, wherein the chromium volume includes an oxide of chromium and metallic chromium.

20. The electrical structure of claim 18, wherein the acid solution includes hydrochloric acid in a liquid bath form.

21. The electrical structure of claim 18, wherein the acid solution includes hydrochloric acid in a spray form.

22. The electrical structure of claim 18, wherein said iron-comprising body includes steel.

23. The electrical structure of claim 18, further comprising a layer of conductive metal, wherein the chromium

volume includes a layer of chromium, and wherein the layer of chromium is on the layer of conductive metal.

24. The electrical structure of claim 18, wherein the acid solution is not in contact with the layer of conductive metal.

25. The electrical structure of claim 24, wherein the iron-comprising body includes steel, wherein the acid solution includes hydrochloric acid, and wherein the layer of conductive metal includes a metal selected from the group consisting of copper, aluminum, nickel, silver, and gold.

26. The electrical structure of claim 18, further comprising a layer of conductive metal, wherein the chromium volume includes a layer of chromium, wherein the layer of conductive metal is on the layer of chromium, wherein the conductive metal includes an opening extending through its thickness, wherein the opening exposes the layer of chromium, wherein the iron-comprising body is in continuous electrical contact with the chromium volume, and wherein the acid solution is in contact with both the iron-comprising body and the chromium volume within the opening.

27. The electrical structure of claim 26, wherein the iron-comprising body includes steel, wherein the acid solution includes hydrochloric acid, and wherein the layer of conductive metal includes a metal selected from the group consisting of copper, aluminum, nickel, silver, and gold.

28. The electrical structure of claim 18, wherein the iron-comprising body includes steel, wherein the chromium volume includes metallic chromium, wherein the acid solution includes hydrochloric acid, wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M), and wherein the etch rate is at least a factor of about 2 greater than an etch rate that would occur in an absence of the iron-comprising body.

29. The electrical structure of claim 18, wherein the iron-comprising body includes steel, wherein the chromium volume includes metallic chromium, wherein the acid solution includes hydrochloric acid, wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M), and wherein the etch rate is at least about 5 Å/second.

30. The electrical structure of claim 18, further comprising a flouropolymer dielectric volume bonded to said chromium volume.

add B4